

Appl. No. : 10/777,053
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AMENDMENTS TO THE CLAIMS

1. (Currently amended) An expression vector~~isolated nucleic acid~~ comprising a reading frame that does not encode a whole tumor associated antigen, wherein the reading frame comprises ~~comprising~~ a first sequence, wherein said first sequence encodes one or more segments of tumor-associated antigen SSX-2 (SEQ ID NO: 40), ~~wherein the first sequence does not encode the complete SSX-2 antigen,~~ and wherein each segment comprises an epitope cluster, said cluster comprising or encoding at least two amino acid sequences having a known or predicted affinity for a same MHC receptor peptide binding cleft, wherein said expression vector comprises a promoter operably linked to said reading frame.

2. (Currently amended) The ~~nucleic acid~~ expression vector of claim 1, wherein said epitope cluster is chosen from the group consisting of amino acids 5-28, 16-28, 41-65, 57-67, 99-114, 167-180, and 167-183 of SSX-2.

3. (Currently amended) The ~~nucleic acid~~ expression vector of claim 1, wherein said one or more segments consist of said epitope cluster.

4. (Currently amended) The ~~nucleic acid~~ expression vector of claim 1, wherein said first sequence encodes a fragment of SSX-2.

5. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 90% of the length of SSX-2.

6. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 80% of the length of SSX-2.

7. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 60% of the length of SSX-2.

8. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 50% of the length of SSX-2.

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9. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 25% of the length of SSX-2.

10. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment consists of a polypeptide having a length, wherein the length of the polypeptide is less than about 10% of the length of SSX-2.

11. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 5-65, 5-67, or 5-114.

12. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 16-65, 16-67, 16-114, 16-180, or 16-183.

13. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 41-67, 41-114, 41-180, or 41-183.

14. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 57-114, 57-180, or 57-183.

15. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 99-180 or 99-183.

16. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises amino acids 16-183 of SSX-2.

17. (Currently amended) The ~~nucleic acid~~ expression vector of claim 16, wherein said first sequence encodes exactly amino acids 15-183 of SSX-2.

18. (Currently amended) The ~~nucleic acid~~ expression vector of claim 4, wherein said encoded fragment ~~consists essentially of~~ comprises an amino acid sequence beginning at one of amino acids selected from the group consisting of 5, 16, 41, 57, and 99 of SSX-2, and ending at one of the amino acids selected from the group consisting of amino acid 65, 67, 114, 180, and 183 of SSX-2.

19. (Currently amended) The ~~nucleic acid~~ expression vector of claim 1, further comprising a second sequence, wherein the second sequence encodes ~~essentially~~ a housekeeping epitope that is mature or that is flanked by one to several additional amino acids which permit the

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housekeeping epitope to liberated by immunoproteasomal processing, directly or in combination with N-terminal trimming or the action of exogenous enzymatic activities.

20. (Currently amended) The nucleic acid expression vector of claim 1, wherein said reading frame is operably linked to a promoter.

21. (Currently amended) The nucleic acid expression vector of claim 19, wherein said first and second sequences constitute a single reading frame.

22. (Cancelled)

23. (Currently amended) An isolated polypeptide comprising the amino acid sequence encoded in said reading frame of claim 22_1.

24. (Currently amended) An immunogenic composition comprising the nucleic acid expression vector of claim 22_1.

25. (Currently amended) An immunogenic composition comprising the polypeptide of claim 23.

26. (New) The expression vector of Claim 4, wherein said encoded fragment consists of amino acids 5-65, 5-67, 5-114, 16-65, 16-67, 16-114, 16-180, 16-183, 41-67, 41-114, 41-180, 41-183, 57-114, 57-180, 57-183, 99-180 99-183, 16-183 or 15-183 of SSX-2, with zero to six additional amino acids on at least one terminus.

27. (New) The expression vector of Claim 19, wherein said second sequence encodes a string of epitopes, wherein one or more of said epitopes is the housekeeping epitope.

28. (New) An isolated nucleic acid comprising:

a reading frame comprising a first sequence, wherein said first sequence encodes one or more segments of tumor-associated antigen SSX-2 (SEQ ID NO: 40), and wherein each segment comprises an epitope cluster, said cluster comprising or encoding at least two amino acid sequences having a known or predicted affinity for a same MHC receptor peptide binding cleft, wherein the isolated nucleic acid does not encode the complete SSX-2 antigen; and

a liberation sequence.

29. (New) The isolated nucleic acid of Claim 28, wherein the liberation sequence is part of the same reading frame as said first sequence.

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30. (New) The isolated nucleic acid of Claim 28, wherein the liberation sequence is part of a different reading frame than the first sequence.

31. (New) An isolated nucleic acid sequence encoding a fragment of tumor associated antigen SSX-2 and a liberation sequence.